ASSISTANT SECRETARY OF DEFENSE
6000 DEFENSE PENTAGON
WASHINGTON, DC 20301-6000

November 19, 1999

COMMAND, CONTROL, COMMUNICATIONS, AND INTELLIGENCE

MEMORANDUM FOR UNDER SECRETARY OF DEFENSE (ACQUISITION TECHNOLOGY AND LOGISTICS)

SUBJECT: Section 912, C3 Integration Study Group Final Report

I am pleased to forward the attached Joint Study Group Final Report on the Establishment of a Joint Command, Control and Communication (C3) Integrated System Development Process prepared in support of the Secretary's "912" initiative started last year. Formal comments on the report and their disposition are also attached.

The Joint Command and Control Integration/Interoperability Group (JC2I2G) has been formed and is functioning. The U.S. Joint Forces Command (JFCOM) in its new role as "Joint Forces Integrator" has entered into a Memorandum of Agreement with the JC2I2G and became a member of that group. The process enables the Services to work together to solve interoperability problems important to the CINCs. The Section 912c C3 Integration Study Group has completed the work and is dissolved.

I intend to continue to track JC2I2G's progress. I feel we have made great progress towards joint interoperability in the teaming of the Services' command and control systems development organizations/acquisition commanders and USJFCOM, the CINCs, and the Joint Staff.

Arthur L. Money

Attachments:
As stated

cc:
JC2I2G
Joint Staff, J6

OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE
6000 DEFENSE PENTAGON
WASHINGTON, DC 20301-6000

:OMMAND, CONTROL,
)MMUNICATIONS, AND
INTELLIGENCE

September 17, 1999

MEMORANDUM FOR ~~SENIOR CIVILIAN OFFICIAL, O~~ASD(C3I)

THROUGH: PRINCIPAL DEPUTY 11/16/99
DASD (C3ISR & Space) SKUNDON 11/16/99

FROM: Director, Program Analysis and Integration 11/9
Prepared by: Paul Szabados, PA&I, (703) 607-0703

SUBJECT: 912c C3 Integration Study Group Final Report - ACTION MEMORANDUM

PURPOSE: Forward the final report to USD(A&T)

DISCUSSION: In the July 1999 In-Process Review, Dr. Gansler and Mr. Money tasked the Joint Command and Control Integration/Interoperability Group (JC2I2G) to resolve the remaining critical issue regarding the relationship between the Joint Forces Program Office (JFPO) of the JC2I2G and USACOM. In the August 24th, 1999, JC2I2G conference at Hanscom AFB, a Memorandum of Agreement (MOA) was written based on discussions with USACOM/J-6, BG McElwee. The MOA defines the relationship with USACOM and the JC2I2G to include the JFPO. The MOA adds the USACOM/J6 as a sitting member of the JC2I2G and defines the roles and responsibilities of JC2I2G and USACOM in this relationship. This MOA resolved the issue of ownership of the JFPO. USACOM ~~is expected to be~~ was redesignated United States Joint Forces Command (JFCOM) effective October 1, 1999. The 912c C3 report is now completed and provided for Mr. Money's transmittal to Dr. Gansler. The 912c C3 Integration Study Group work is completed.

COORDINATION: DUSD(Acquisition Reform)
Director C4, Joint Staff

RECOMMENDATION: Sign the memorandum transmitting the report to USD(A&T) and disestablish the 912c C3 Integration Study Group.

Approved: _____
Disapproved: _____
Other: _____

SUSPENSE: DASD Control No. ~~n/a~~ C3ISR-605
Please call AO when signed

KP 11-18

OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE
6000 DEFENSE PENTAGON
WASHINGTON, DC 20301-6000

:OMMAND, CONTROL,
)MMUNICATIONS, AND
INTELLIGENCE

September 17, 1999

MEMORANDUM FOR SENIOR CIVILIAN OFFICIAL, OASD(C3I)

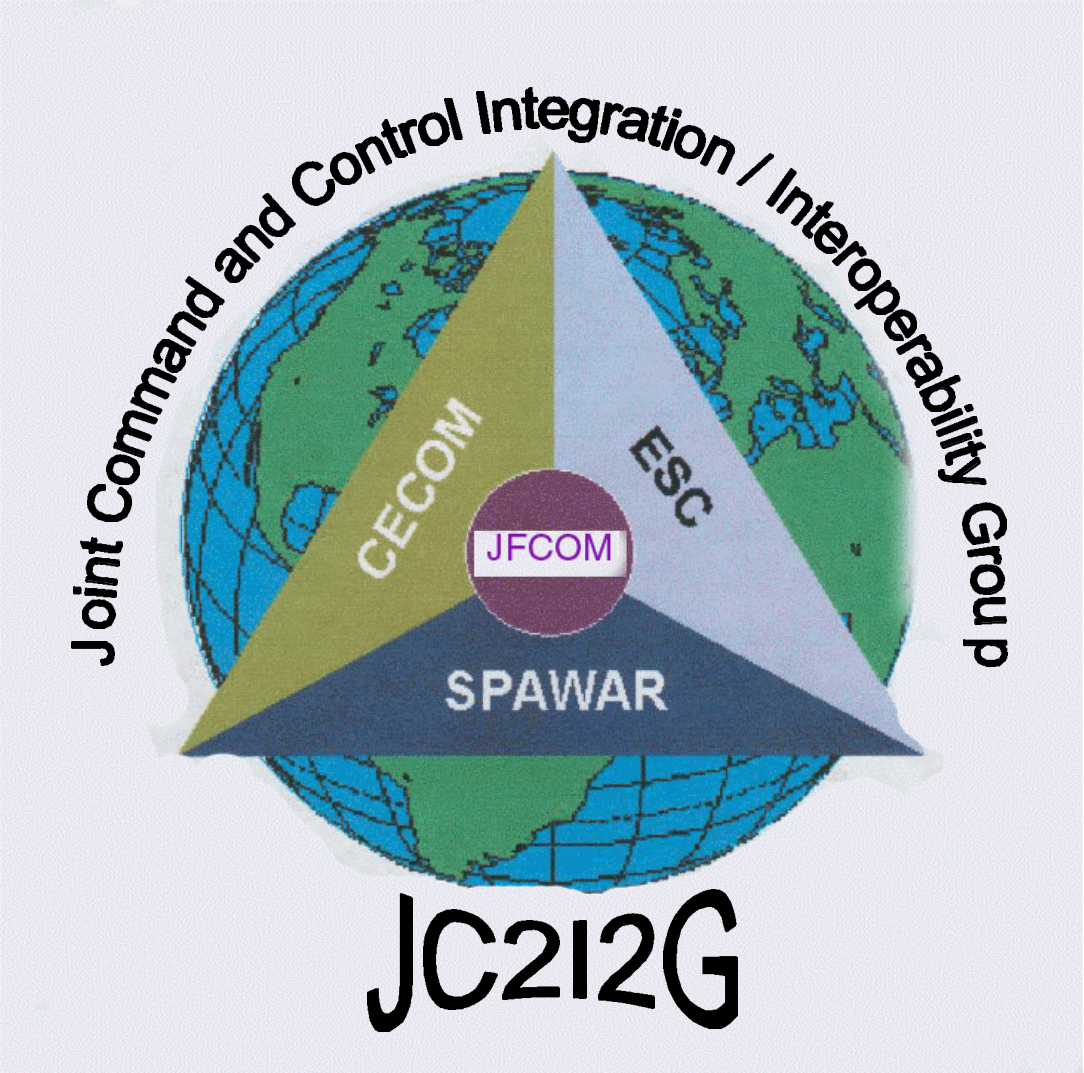
SUBJECT: Section 912 C3 Integration Study Group Final Report

The Joint Study Group Final Report on the Establishment of a Joint Command, Control and Communication (C3) Integrated System Development Process is attached. All issues are resolved. A record of formal comments and associated disposition is also attached. The final report and formal comments/disposition are ready to send to USD(A&T).

Since the study group has completed its work, I recommend the study group be dissolved.

John Buchheister
Team Leader
Section 912c C3 Study

Attachments:
As Stated



Section 912c

JOINT STUDY GROUP FINAL REPORT
ON THE
ESTABLISHMENT OF A JOINT COMMAND CONTROL, AND COMMUNICATIONS (C3) INTEGRATED SYSTEM DEVELOPMENT PROCESS

1 October 1999

Background

Section 912 of the FY 98 Defense Authorization Act included several requirements pertaining to acquisition. In an April 1998 report to Congress responding to some of those requirements, the Secretary of Defense noted that "joint operations have been hindered by the inability of forces to share critical information at the rate and at the locations demanded by modern warfare." To address this problem, the Secretary directed the creation of a study group to examine ways to establish a joint command, control, and communication (C3) integrated system development process.

Authority

In response to the Secretary's report to Congress, the Under Secretary of Defense (Acquisition and Technology) and the Senior Civilian Official of the Office of the Assistant Secretary of Defense (Command, Control, Communications, and Intelligence) (ASD(C3I)) established the Joint Command and Control Acquisition Study Group (JC2ASG). They agreed that the Commanders of the services' Command and Control (C2) systems development organizations/acquisition centers would form the study group and focus on joint C2 system integration and interoperability. The study group included the Commanders of the Army's Communications Electronics Command (CECOM), the Air Force's Electronic Systems Center (ESC), and the Navy's Space and Naval Warfare Systems Command (SPAWAR). This study group reported its concepts and revised its products based on input from the USD (A&T), OASD(C3I), DSB Advisor, DISA, Joint Staff J-6, and the services C4I chiefs. (Study team members are listed at Appendix A).

Mission

The JC2ASG mission was to propose changes in processes, management structures and forums to implement Joint C2 integration and interoperability among Services by ensuring that:

A "Joint First" perspective will be initiated during Joint and individual Service modernization initiatives. Programs will be aligned with the Commander-in-Chiefs (CINC's) C2 Concept of Operations and Integrated Priority List.

Joint C2 Integration and Interoperability will be advanced at every opportunity
Integration and interoperability problems with existing systems will be fixed using joint solutions. Opportunities to enhance C2 integration and interoperability will be implemented.

Exploiting integration/interoperability opportunities discovered through joint experimentation and innovation to advance the CINC's C2 capability
Service C2 Integration Facilities will be also used for joint experimentation and evaluation of technology necessary to define and support future operational concepts and future system requirements. These facilities will be used to evaluate integration and interoperability of new C2 systems before their deployment.

The study group's focus and construct are primarily oriented towards C3 acquisitions under service control.

The Construct

The JC2ASG commenced working in May 1998 categorizing the integration hurdles in terms of requirements, organization, acquisition/policy and technology. The group made maximum use of previous Defense Science Board (DSB) studies and worked with the Joint Staff and Service staffs. The study group agreed to institutionalize the relationship they had established during the study process into a formal alignment expressly for the purpose of managing efforts to further joint C2 interoperability. The commanders agreed to form the Joint Command and Control Integration/Interoperability Group (JC2I2G). The JC2I2G will not obviate, usurp, or duplicate existing Joint Staff, DISA or other organizations chartered responsibilities. Policies, doctrine, architectural integrity and interoperability standards regarding C2 interoperability will be fully supported and reinforced by the JC2I2G (e.g., DODD 4630.5, DODI 4360.8, CJCSI 3170.01). The

operating parameters of the group are set forth in a memorandum of agreement signed by the three commanders and the Senior Civilian Official of the Office of the ASD(C3I) (Appendix B) and outlined later in this report. The group also agreed to collocate some of their personnel to establish three CINC Interoperability Program Offices (CIPO), one at each of their headquarters locations and a distributed Joint Forces Program Office (JFPO). In August of 1999 the JC2I2G agreed to add U.S. Atlantic Command (ACOM) as a siting member of the JC2I2G. A MOA was signed (Appendix C). ACOM will be re-designated Joint Forces Command (JFCOM) on October 1, 1999 under Unified Command Plan of 1999 (UCP-99). JFCOM's new role as joint forces integrator and experimenter is a complementary role with the Joint Forces Program Office. This relationship is defined in Appendix C.

Critical Success Factors

The study group identified the following critical factors for ensuring all future efforts will be "Joint First" and existing systems will be fixed at every opportunity:

- Coordinate solutions to CINC integration and interoperability issues across CINCs and ensure solutions comply with the Joint Technical Architecture (JTA) and Defense Information Infrastructure where applicable.
- Address the requirement for joint interoperability from the beginning of the system development process and achieve an interoperability yield throughout the system development and product improvement processes.
- Continuously seek opportunities to advance the level of integration and interoperability across CINC and Joint Task Force (JTF) capabilities and into service capabilities.
- Provide each CINC with a service acquisition focal point for the solution of interoperability problems and to capitalize on interoperability opportunities.
- Provide each CINC with information on advances in technology to help them formulate their requirements.

- Support ACOM in its role as executive agent for joint integration and joint warfighting experimentation.
- Use a disciplined process to identify common products and services across the Services.
- Use an index to measure the level of C2 integration and interoperability.
- Focus on the retrofit of legacy systems to achieve interoperability.
- Maintain a "Blueprint" of CINC/JTF C2 systems. The operational and development test and evaluation community, including the Joint Interoperability Test Command, will support the spiral development process.

Processes to be Employed

Spiral Development

A spiral development acquisition process will be employed to primarily provide the CINC with rapid fixes to legacy and transition C2 I2 issues and to recommend and, as required, to rapidly field new C2 capabilities. The process is based on a schedule driven cycle that uses concurrent development and test of systems and examines requirements and procedures at the same time. The projected result is a C2 capability the CINC can use. In subsequent cycles in the spiral process, incremental capability is provided to satisfy system requirements or recommendations to requirements are based on "Lessons Learned" from using the initial or previous capability.. Modular Contracting will be explored as a means to maintain relatively stable contract requirements, but allow flexibility for insertion of new technologies to enhance system performance. While, the process primarily applies to legacy systems, it does not prevent the insertion of appropriate operational testing where necessary. To facilitate the execution of the spiral development process, a new organizational structure will provide a bridge between CINC/JTF users and the C2 system developers, contractors and testers.

Configuration Management (CM)

A CM process will be developed for each CINC's C2 systems. This process will "Blueprint" the CINC's C2 system and maintain configuration awareness of the system.

The "Blueprint" will document the CINC's C2 system by providing information to clearly distinguish all components in the system. The process will follow DoD's architectural framework guidelines.

Domain Engineering

Domain engineering is a process for the systematic analysis of an enterprise and the resulting design of an architecture. Its goal is to identify a set of reusable assets that can be used to construct a family of related applications or subsystems. This process will be used to analyze the CINC's C2 systems to identify the common applications and infrastructures for advancing I2 and achieving efficiencies.

Integration/Interoperability Management Process

The JC2I2G will establish a management process to continuously review, oversee, plan, and direct joint I2 improvements.

JC2I2G Products / Metrics

The Study Group recommends the JC2I2G adopt the following set of Products and Metrics to measure CIPO and JFPO performance.

Command and Control (C2) Roadmap

The CIPOs will work with the CINC to develop a C2 modernization roadmap and master schedule. These tools will ensure products and services fielded by the Services and Joint Agencies continue to advance the Joint Force C2 capability through integrated and interoperable C2systems. The JC2I2G will meet monthly to track progress along the roadmap and the execution of the master schedule. Progress will be reported to the OASD(C3I).

Plan for Measuring Metrics

A variety of specific tools must be developed to plan for, evaluate and assess progress towards interoperability. Most important is the generation of I2 indices or report cards which will permit the acquisition community, end users, CINCs and OASD(C3I) to measure and track the progress of CINC C2 systems towards interoperability. CINC-approved candidate solutions will be derived from assessing lessons learned from joint

exercise, demonstrations and experiments. Some known candidate metrics under investigation are:

Levels of Information Systems Interoperability (LISI)

The Joint LISI model provides a deterministic methodology for measuring the level of systems integration and interoperability. LISI provides both a technical reference model allowing a depiction of "levels of interoperability" for a particular system as compared to that reference, and tools that allow a comparison of multiple systems using that same reference model. These comparisons can be used to show a common level of interaction to which system integration efforts should succeed.

Joint Information Exchange Requirements (JIER) Implementation

Implementation of CINC-approved JIER provides a measurable, enforceable, outcome-based evaluation directly tying interoperability to the satisfaction of the specific warfighter's needs. It can be applied throughout all stages of the requirements and acquisition process and will be evaluated as an aid in identifying and resolving joint interoperability issues.

Organizational Structure

Joint Command and Control Integration/Interoperability Group (JC2I2G)

The structure the study group proposed to manage Joint C2 Integration/Interoperability is shown in the figure below. This management structure relies on the united efforts of the CECOM, ESC and SPAWAR commanders, ACOM/J6, and the CIPOs/JFPO directors, but recognizes the need for advisory support from the user/operator and information technology community. This arrangement ensures command attention to joint integration and interoperability issues. This structure does not replace existing interoperability management, procedures or processes, it is meant to supplement and support other DoD integration and interoperability activities by providing engineering and technical solutions to legacy, transition and emerging programs

JC2I2G Management Forum

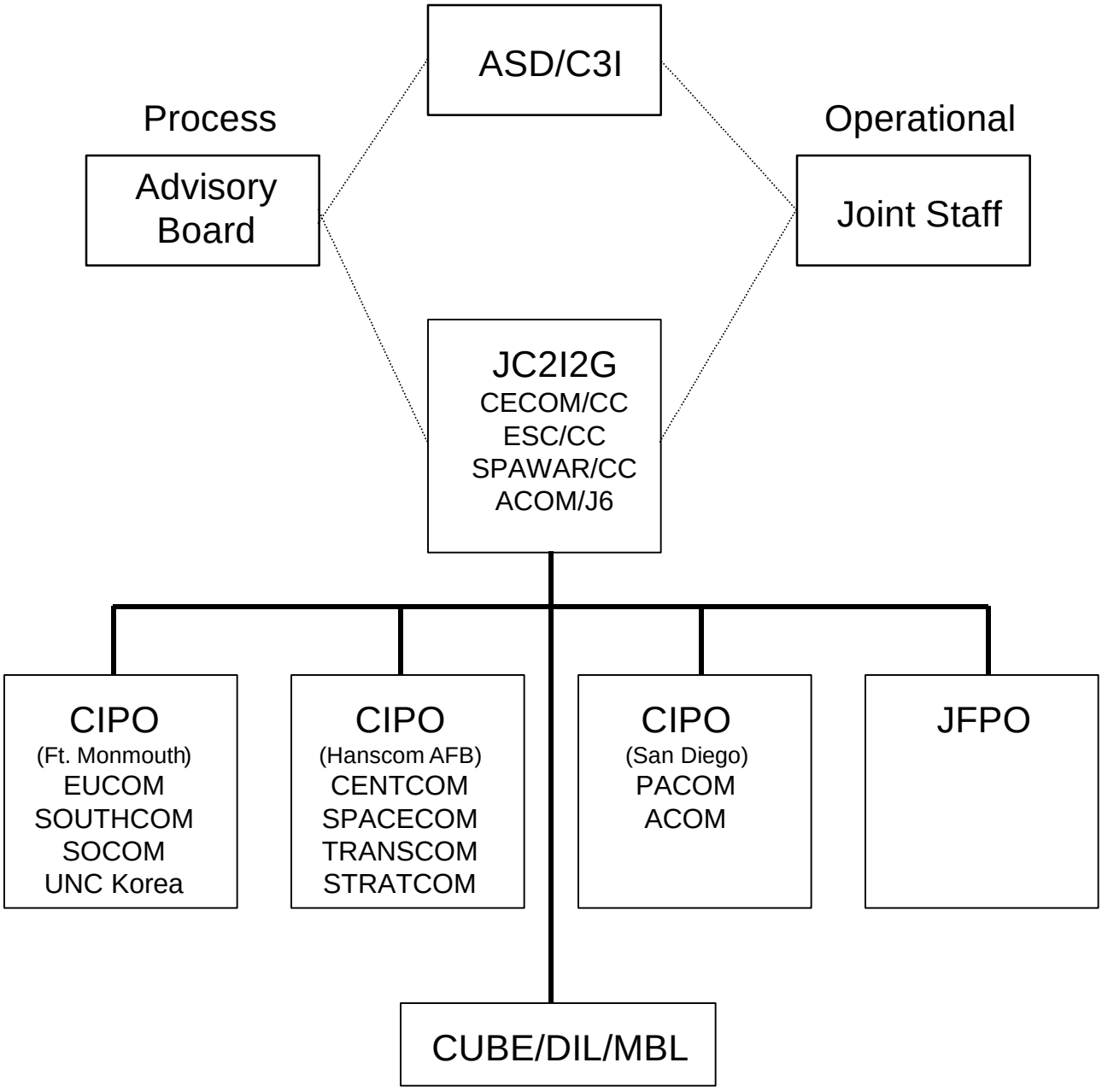


Figure 1

The JC2I2G will accomplish its mission and achieve its objectives through the CIPO, which focus on each of the nine unified commands and United Nations Command Korea. The JC2I2G will obtain horizontal integration across CINCs and across C2 systems through the Joint Forces Program Office (JFPO). CIPO and JFPO efforts will concentrate on engineering and technical aspects of legacy and transition system integration and interoperability issues. Both the CIPO and JFPO organizations will be staffed with a mix of CECOM, ESC and SPAWAR personnel at each location. Additionally, DISA will provide staff to support each CIPO location. An existing, formalized, integration capability has already been established through the interconnection of the three acquisition centers' test beds, CECOM's Digital Integrated Lab (DIL), ESC's Command and Control Unified Battlespace Environment (CUBE), and SPAWAR's Maritime Battle Lab (MBL). These test beds, the Joint C4ISR Battle Center, and the Federated Battle Lab (FBL) network will be utilized by the JFPO in this Joint Command, Control, and Communication (C3) Integrated System development process for stress testing joint system interoperability, solutions, new concepts and technologies. The FBL network is currently in the process of integrating the Joint Interoperability Test Command (JITC) testbed into its network. When completed this will ensure joint interoperability product certification across the Service Acquisition Centers. Integration by the JC2I2G will include specific Service entities such as the U. S. Army Central Technical Support Facility, a cornerstone for Army C2 integration/interoperability certification and testing. The JFPO will explore connections of the FBL network with other joint technical facilities (e.g., Joint National Test Facility, Joint Battle Center) to facilitate joint interoperability development and operational testing and joint concept development.

The JC2I2G will maintain a routine dialogue with the CINC or the CINC's designated representative to ensure the group's efforts are meeting the CINC's needs and to enlist the CINC's support for issue resolution. This dialogue will include attention to emerging Joint Staff activities as outlined CJCSI 3170.01 and draft CJCSI 6724.01 and as appropriate to the CIPOs and JFPO missions. The JC2I2G provides direction to and receives

reports/recommendations from the CIPO and the JFPO. The group employs the resources of their respective commands to act on the recommendations of the CIPO and JFPO and to resolve, at their level, integration/interoperability issues under their control. . CIPOs and the JFPO will work with CINCs staffs to resolve integration and interoperability issues as appropriate. The CIPOs and JFPO will also participate in Joint Experimentation and exercises providing engineering work and technology advice to resolve/identify integration and interoperability issues as appropriate for the JC2I2G scope of work. These may include provision of engineering and technical support to the CINCs on exercises, Joint Experimentation, and reviews of mission need statements (MNS) and operational requirement documents (ORDS) as requested by the CINCs staffs.

The JC2I2G will also maintain a dialogue with C2 interoperability activities/programs of other forums such as the Military Communications Electronics Board, the Joint Commanders Group - Communications Electronics, DISA and the Joint Staff to ensure the group's activities neither duplicate or proceed at cross-purposes to those activities/programs. The CIPOs/JFPO in their work will consider other ongoing integration activities. These include the GCCS Flag Advisory Board/GCCS Review Board, C2 Interoperability Assessment Working Group, and Joint Operational Architecture Working Group. CIPOs and the JFPO will also screen as appropriate Service programs for levels of integration and interoperability in operational architectures, system architectures and the Joint Technical Architecture. Further, the CIPOs and the JFPO will recommend changes and/or resolve issues of systems integration as appropriate using draft CJCSI 6724.01 as the policy guide.

The JC2I2G will provide its assessment of the I2 strategy for resolution and progress to the OASD(C3I).

CINC Interoperability Program Office (CIPO)

CIPOs are located at each service‘s acquisition centers (Fort Monmouth, Hanscom AFB, and San Diego) and staffed jointly with military/civilian exchange officers from each Service or Service Acquisition Centers. Each of the three CIPOs will be assigned

approximately 20 military/civilian personnel. DISA will also provide staff to support each CIPO location. The CIPOs will support assigned CINCs by improving the interoperability and integration of C2 systems. The CIPO will advocate their assigned CINC's C2 system requirements in joint and service modernization initiatives, and look to the JFPO and its special relationship to ACOM (Appendix C) to ensure that these are not point solutions, but provide enhanced integration and interoperability across all CINCs. Each CIPO will ensure that system developers remain aware of I2 issues impacting the CINC's C2 capabilities, that C2 system developers resolve their CINC's issues, and remain the CINC's focal point for supporting the acquisition center's C2 systems.

The CIPOs will blueprint the CINC's baseline C2 I2 capability. The baseline will document the current C2 systems supporting the CINC's C2 capability to measure the success of solutions to CINC priorities and as a means of determining the impact of C2 Acquisition Plans and Trade-offs on the CINC’s C2 capability. The CIPOs will utilize the JFPO developed I2 indices/report card to measure and track the I2 compliance of the CINC's C2 systems. The I2 indices/report card will help to develop high payoff initiatives against the CINC C2 Roadmap. Additionally, CIPOs will maintain awareness of changes in the operational environment to determine impacts to the CINC's current C2 capabilities and the fielding of solutions to I2 issues and support the CINC in time of crisis by working with the C2 system developers to resolve C2 I2 issues. The CIPOs will also be aware of, and provide to the CINCs, information on new and evolving technical capabilities for potential C2 system upgrades. The CIPOs will also support as requested the CINCs during the acquisition process by reviewing MNS, ORDS, and system requirements from an engineering and technical point-of-view. During each phase the CIPOs will provide comments to ensure the CINCs I2 needs are addressed and satisfied. The CIPOs will coordinate cross-CINC requirements with the JFPO to facilitate efficient, economic, and interoperable solutions across the CINCs. CIPOs will focus on their assigned CINCs particular needs. The assignments of CIPOs to CINCs are as follows:

CIPO (Fort Monmouth)	EUCOM
	SOUTHCOM
	SOCOM
	UNC Korea
CIPO (San Diego)	PACOM
	ACOM (designated as JFCOM in UCP-99)
CIPO (Hanscom)	CENTCOM
	SPACECOM
	TRANSCOM
	STRATCOM

Joint Forces Program Office (JFPO)

The Joint Force Program Office will be focused to ensure horizontal integration of I2 C2 solutions across the Joint Forces to advance Jointly Interoperable C2 “system of systems" to enable dominant battlespace command and control for our Joint Forces. A key aspect of the JFPO is its small size and distributed organization to permit efficient, agile, and focused support for the JC2I2G framework. JFPO objectives are:

- To advance the Joint Force's C2 capability at every opportunity through enhanced integration and interoperability, I2, of current C2 systems
- To assure CINC and individual service force modernization initiatives are aligned with Joint Force’s C2 Concept of Operations, CONOPS
- To exploit I2 opportunities discovered through experimentation and innovation to advance Joint Forces C2 capability

The JFPO will be initially fielded at the SPAWAR CIPO location. Because of the emerging role of USACOM as Joint Force Integrator and Experimenter, USACOM will be the primary CINC interface for the JFPO. The relationship and responsibilities between the JFPO and ACOM are defined in the MOA between JC2I2G and ACOM (Appendix

C). This implementation will be reviewed after the first year. A SPAWAR CIPO member will head the initial JFPO cadre. The cadre will establish the foundation for the JFPO and recommend to the JC2I2G the details regarding the technical, programmatic, administrative support required from acquisition center resources and product-oriented programs. The JFPO CONOPS is currently under development. The goal is for the JFPO manning billets to be joint duty designated billets.

While the CIPOs provide a bridge between individual Service Acquisition Centers and their assigned CINCs, the JFPO provides the bridge across the acquisition centers and their CIPOs to promote common products, as well as working with ACOM in assessing CINC unique products for cross-CINC applications. The JFPO will assist in focusing the acquisition centers networked testbeds (CUBE, DIL & MBL), to support experimentation of newly developed C2 capabilities, the interoperability testing of new systems, and the assessment of new technologies. Where experiments field systems the CINC can use immediately, the JFPO will work to arrange the appropriate support for the "Leave Behind" capability. Currently a process is in place to establish network connections between the testbeds to support experiments and testing. The JFPO will work with the Integration Facilities' management to develop a process for joint acquisition experimentation and testing to include certification testing with the JITC.

The JFPO will ensure the Services, each CINC (through their CIPO), DISA, and the Joint Staff are fully informed of I2 architectural issues associated with Joint standards and products, e.g., GCCS/GCSS, DMS, DII/COE, and JTA. The JFPO and CIPOs will coordinate new or proposed standards for inclusion in the JTA with the DoD executive agent for information standards, DISA Center for Standards, and its supporting structures consisting of Joint Staff, CINCs, Services, and agencies. They promote Joint Staff and DoD policy and standards, and ensure common products are utilized. However, the use of common products does not necessarily equate to interoperability between products. This is particularly true with legacy systems, where cost is prohibitive to repurchase common products across the Services. The JFPO will identify I2 issues impacting CINCs

with particular emphasis on known or potential cross-CINC issues. The JFPO and CIPO will report its assessment of the I2 issues, resolution strategies, and progress to the JC2I2 Commanders Group.

Issue Resolution

The goal is for issues to be resolved at the lowest level within the JC2I2G, CIPOs and JFPO. If an issue is not resolvable at the JC2I2G level, then issue stakeholders (acquisition or requirements) at the Service, CINCs and Joint Staff levels will be included to work the issue and recommend a resolution. Issue resolution will be conducted in coordination with appropriate CINCs , ACOM in its emerging role as Joint Force Integrator and Experimenter and member of the JC2I2G, Joint Staff (J-2, J-3, J-6, and J-8), appropriate Joint Warfighter Capability Assessments (JWCAs), Joint Staff (CJCSIs) and the Joint Interoperability Test Command (JITC). If an issue is not resolved at the Services, CINCs and Joint Staff levels, then it will be elevated to the ASD(C3I) and USD(A&T) as necessary. Under the structure illustrated below all parties impacted by the decision will be part of the process.

Issue Resolution Process

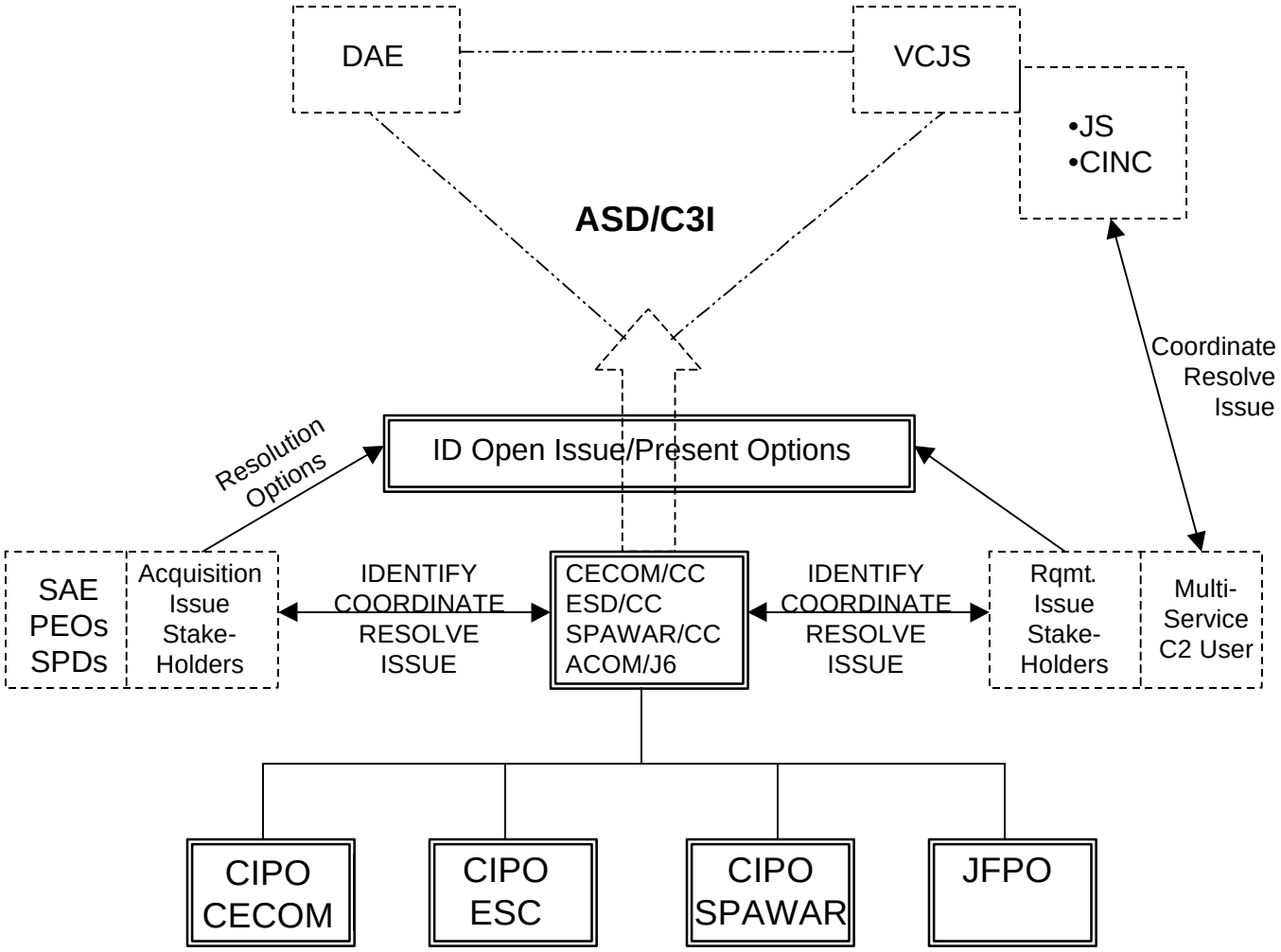


Figure 2

Requirements

Financial

The JC2I2G will establish and fund the CIPO and the JFPO within the existing manpower and dollar resources of their respective commands. The JC2I2G employs the resources of their respective commands to act on recommendations of the CIPO and JFPO and to resolve, at their level, integration/interoperability issues under their control.

Existing Resources

The Joint C4ISR Decision Support Center (DSC) conducts quantitative and qualitative analysis to support C2 system requirements and decisions makers, leading to fielding of the components of the DoD integrated C4ISR System of Systems for joint and combined operations. The JC2I2G, CIPOs and the JFPO will need full access to the DSC completed studies and will have the opportunity to participate in current studies and/or recommend future studies to ASD(C3I).

The CINC Federally Funded Research and Development Center (FFRDC) support is an already available resource, which could be used to identify and articulate methods for resolving joint C2 interoperability issues. The CINC's must evaluate and decide on their FFRDC's assets in the C2I2 process. The extent that this resource could be used will be determined as the CIPO and JFPO organizations begin to evolve and operate.

Training

There are no near term service resource requirements/impacts resulting from JC2I2G's establishment of the CIPO and JFPO infrastructure. It is envisioned that this initiative will provide a unique on-the-job training resource for Service (ESC, CECOM and SPAWAR) personnel to further the development and fielding of joint solutions.

CIPOs and JFPO will be jointly manned. Service personnel will have the opportunity to have direct visibility into the 'host' Service's organization, best practices, as well as

unique end user requirements. Alternatively, the host Command staff will gain a better understanding of the other Service's requirements, programs and practices to allow maximum leveraging from each other's activities. Over a sustained period, this cross service exposure to the wide range each others' practices creates "jointly trained personnel" who will help to foster education with their individual Service to the concept and the principle of "Joint First" development.

Barriers/Aids to Success

Barriers to Success - limited incentives to solve joint integration and interoperability problems

The team identified areas of difficulty where the proposed approach challenges the existing institutional C2 acquisition practices. The following are those "barriers" that limit the potential for successful implementation.

- Services are forced to fund for Joint efforts out of their total obligation authority (TOA) which will directly compete for Service requirements.
- Joint Military credit is critical in order to draw the best participants for the CIPO/JFPO assignments. Otherwise, there is a limited talent pool from which to draw. These personnel will ultimately help to enable change in Service culture to "Joint first".
- FFRDC ceiling is falling and will hamper allocation of FFRDC talent to this effort.
- Without additional Service funding for development of metrics and I2 indices, these initiatives will compete for resources with other Service specific initiatives.
- Joint requirement for integration and interoperability are inadequate to plan and implement "Joint First" solutions.
- Currently, Services/Program Managers are reluctant to report projected or realized savings, as those savings are most often removed or credited before the savings are realized. Incentives to operate more efficiently is lost if there is no opportunity realize the saving or reinvest a portion of savings in continual improvement, as is done many private sector models.

Aids to Success

To overcome some of these barriers, the Department will evaluate the benefits and feasibility of a number of initiatives, and begin to implement the ones that are deemed viable. The following initiatives are preliminary candidates, compiled by the team, which may aid in the success of the proposed approach.

- Code military authorization in CIPOs/JFPO as joint to allow joint credit for officers serving in these units.
- Recommend the establishment of a multi-year IT appropriation to allow for flexibility to take greater advantage of the ability to lease (when most economical and practical) rather than 'buy' hardware with a short technological life span. As multi-year Operational and Maintenance (O&M) funding is limited, Services are often left with no alternative but to utilize single year funding, usually operational procurement (OP), which requires procurement of hardware rather than its lease. This funding constraint makes it more difficult to insert technology on a two-year cycle and increases down stream support for technically obsolete systems, which must remain, supported.
- Establish a DOD interoperability funding line to protect CECOM, ESC, and SPAWAR initiatives to further joint C2 interoperability.
- Implement a private sector business model whereby activities are incentivized to cut costs and then rewarded by retaining a portion of the realized/projected savings for reinvestment or furthering of efficiencies. The current model stifles efficiency, 'out of the box' thinking and ultimately has negative impact on achieving enhanced interoperability by fostering 'business as usual'.
- Allocate sufficient FFRDC ceiling to support CIPOs/JFPO and CINC C2I2 operations or use existing CINC Staff to resolve issues.
- Coordination and cooperation with the Joint Staff and CINCs and in particular ACOM in its emerging role as Joint Force Integrator and Experimenter.

Plan of Action and Milestones

Study Group Major Milestones	**Date**
FY 99 Progress Reviews to USD(A&T) & SCO ASD(C3I)	Quarterly
Follow-on (Post FY 99) Progress Reviews to USD(A&T) & SCO ASD(C3I)	Semi-As required
Initial CIPOs staffing of ESC, CECOM & SPAWAR	Oct 98
CIPO CONOPS approved	Nov 98
JFPO CONOPS approved	Mar 99
Initial JFPO staffing	Feb99

JC2I2G / CIPO / JFPO Milestones	
In Process Reviews with JFPO/CIPOs	Monthly
JC2I2G Complete CINC Briefings	Mar 99
CIPOs begin development of CINC Roadmap/processes	Feb 99
JFPO/CIPOs begins development of I2 indices/report card	Feb 99
ACOM MOA	Sep 99
JFCOM/J6 becomes member of JC2I2G	Oct 99
CIPOs/JFPO staffing complete	Dec 99

ACRONYMS

ASD/C3I	Assistant Secretary of Defense for Command, Control, Communications and Intelligence
ACOM	United States Atlantic Command (JFCOM as of Oct 99)
C2	Command and control
C2I2	Command, Control, Integration and Interoperability
C3	Command, Control and Communications
CECOM	Communications and Electronics Command
CENTCOM	Central Command

CINC	Commander-In-Chief
CIPO	CINC Interoperability Program Office
CJCSI	Chairman of the Joint Chief of Staff's Instruction
CONOPS	Continuity of Operations
CUBE	Central Unified Battlespace Environment
DII/COE	Defense Information Infrastructure/Common Operating Environment
DIL	Digital Integrated Lab
DISA	Defense Information Systems Agency
DMS	Defense Message System
ESC	Electronic Systems Command
EUCOM	European Command
FBL	Federated Battle Lab
FFRDC	Federally Funded Research and Development Activity
GCCS	Global Command and Control System
GCSS	Global Combat Support System
I2	Integration and Interoperability
ID	Identification
JC2I2G	Joint Command and Control Integration/Interoperability Group
JFCOM	Joint Forces Command (replaces ACOM Oct 99)
JFPO	Joint Forces Program Office
JIER	Joint Information Exchange Requirement
JITC	Joint Interoperability Test Command
JTA	Joint Technical Architecture
JTF	Joint Task Force
JWCA	Joint Warfighter's Capability Assessment
LISI	Levels of Information System Interoperability
MBL	Maritime Battle Lab
MNS	Mission Needs Statement
PACOM	Pacific Command
O&M	Operations and Maintenance

OP	Operational Procurement
ORD	Operational Requirements Document
SAE	Senior Acquisition Executives
SCO	Senior Civilian Official
SOCOM	Special Operations Command
SOUTHCOM	Southern Command
SPAWARS	Space and Naval Warfare Systems Command
SPACECOM	Space Command
SPDs	Special Project Directors
STARTCOM	Strategic Command
TOA	Total Obligated Authority
TRANSCOM	Transportation Command
UNC Korea	United Nations Command Korea
USD(A&T)	Under Secretary of Defense for Acquisition and Technology

APPENDIX A

912 C3 Joint Study Group Members

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October 1, 1999

APPENDIX B

Memorandum of Agreement

Joint Command and Control Integration and Interoperability Group and ASD/C3I

23 OCT 1998

MEMORANDUM OF AGREEMENT
BETWEEN
THE U.S. ARMY COMMUNICATIONS-ELECTRONICS COMMAND,
THE ELECTRONIC SYSTEMS CENTER,
THE SPACE AND NAVAL WARFARE SYSTEMS COMMAND, AND
THE ASSISTANT SECRETARY OF DEFENSE FOR COMMAND, CONTROL, COMMUNICATIONS AND INTELLIGENCE

SUBJECT: Establishment of the Joint Command and Control Integration/Interoperability Group

1. Purpose. The purpose of this memorandum of agreement (MOA) is to establish and outline the operating parameters of the Joint Command and Control Integration/Interoperability Group (JC2I2G).

2. Problem. Section 912 of the FY 98 Defense Authorization Act included several requirements pertaining to acquisition. In an April 1998 report to Congress responding to some of those requirements, the Secretary of Defense noted that "joint operations have been hindered by the inability of forces to share critical information at the rate and at the locations demanded by modern warfare." To attack this problem, the Secretary directed the creation of a study group to examine ways to establish a joint command, control and communication integrated system development process. The Assistant Secretary of Defense, Command, Control, Communications, and Intelligence (ASD/C3I) agreed that the commanders of the services' C3 systems development organizations/acquisition centers would form the study group. The study group included the Commanders of the Army's Communications-Electronics Command (CECOM), the Air Force's Electronic Systems Center (ESC), and the Navy's Space and Naval Warfare Systems Command (SPAWAR). They recommended the formation of the JC2I2G to further command and control integration and interoperability among the services. The Under Secretary of Defense (Acquisition and Technology) and the ASD/C3I approved the study group's recommendation.

3. Scope. The JC2I2G consists of the Commanders of CECOM, ESC and SPAWAR. The group's mission is to enhance the ability of the commanders in chief (CINC) of the nine unified commands and United Nations Command Korea to command and control joint forces. To do this, they will employ the resources of their respective commands and collaborate with/broker solutions among their services and DoD research laboratories, requirements developers, and program executive officers. In continuously seeking opportunities to advance the level of integration and interoperability across the full range of command, control, communications, computers, intelligence, surveillance, reconnaissance, electronic warfare, sensors, target acquisition products and systems, the group will:

a. Arrange for the acquisition of common products when these will satisfy service requirements and advance joint interoperability.

b. Address the requirement for joint interoperability from the beginning of the system development process and achieve an interoperability yield throughout the system development and product improvement processes.

c. Provide each CINC a focal point to solve interoperability problems and capitalize on interoperability opportunities.

d. Provide each CINC with information on advances in technology to help them formulate their requirements.

e. Provide each CINC with limited acquisitions and work to steer all associated efforts towards common solutions.

f. Ensure that any proposed interoperability solutions and acquisitions are compliant with the Joint Technical Architecture and with the Defense Information Infrastructure Common Operating Environment.

g. Support US Atlantic Command in its role as executive agent for joint warfighting experimentation.

4. Understandings and Agreements.

a. Operations. The JC2I2G will accomplish its mission and achieve its objectives through three CINC Interoperability Program Offices (CIPO), one at Fort Monmouth, one at Hanscom AFB and one at San Diego. Each CIPO will be comprised of CECOM, ESC and SPAWAR personnel and headed by an Army/Air Force colonel or Navy captain. A separate document describes the concept of operations of the CIPO. The JC2I2G will obtain horizontal integration across CINC through a distributed Joint Forces Program Office (JFPO), also staffed with CECOM, ESC and SPAWAR personnel and headed by a colonel/captain. A separate paper details the concept of operations of the JFPO. Connectivity between test beds, CECOM's Digital Integrated Lab, ESC's Command and Control Unified Battlespace Environment, and SPAWAR's Maritime Battle Lab will be the underpinning to stress test joint system interoperability, solutions, new concepts and technology.

b. Meetings and Reports. The JC2I2G will meet monthly and will provide quarterly progress reports to the ASD (C3I).

c. Relationships and Authorities. The group reports to the ASD/C3I. Chairmanship of the JC2I2G initiates with the ESC Commander and rotates on an 18-month basis amongst the three commanders, or as directed by the ASD/C3I. The group provides overall direction to and receives reports/recommendations from the chiefs of the CIPO and the JFPO. The local commander provides day-to-day direction to the chief at his installation. The JC2I2G maintains a dialogue with the CINC or the CINC's designated representative to ensure the group's efforts are meeting the CINC's needs and to enlist the CINC's support for issue resolution.

d. Issue Resolution. The group will resolve all issues at the lowest possible level, involving appropriate stakeholders at each stage of the issue resolution process. All parties who will ultimately be impacted by a decision on an issue will be part of the process. The JC2I2G will identify open issues to the ASD/C3I and report progress. The group and associated stakeholders will present resolution options to the ASD/C3I for decision.

(1) The group employs the resources of their respective commands to act on recommendations of the CIPO and JFPO and to resolve, at their level, interoperability issues under their control. When interoperability issues require involvement of Program Executive Offices/Program Managers for resolution, the group will use their existing relationships with the PEO/PM to achieve consensus and implement solutions. The JC2I2G will coordinate with the services' C4 chiefs and acquisition executives to address unresolved PEO-related issues. The group will elevate to the ASD/C3I issues which remain unresolved through this process.

(2) When interoperability issues require involvement of the services' requirements developers, the JC2I2G will use their existing relationships with those requirements organizations to achieve consensus and implement solutions. The group will coordinate with the service staff proponent before elevating to the ASD/C3I requirements issues which remain unresolved through this process.

e. The JC2I2G will maintain a dialogue with and an awareness of C2 interoperability activities/programs of other forums such as the Military Communications Electronics Board, the Joint Commanders Group - Communications Electronics, Defense Information Systems Agency, the Joint Staff, etc. to ensure the group's activities neither duplicate nor proceed at cross-purposes to those activities/programs.

f. The JC2I2G will request, as appropriate, advisory and support services of various organizations structured to contribute to C2 integration/interoperability solutions.

g. As a technical common denominator among CECOM, ESC and SPAWAR and with an existing presence at the unified commands, the group may employ an FFRDC to play an integrating role in identifying, articulating and resolving joint C2 interoperability issues.

h. Resources. The JC2I2G will establish and fund the CIPO and the JFPO within the existing manpower and dollar resources of their respective commands until the requirement can be programmed in the Program Objective Memorandum cycle. The commander at each location will provide office space, furniture, supplies, equipment and an operating budget for the CIPO at his installation. The operating budget will include funds for extensive travel to unified commands, and to home station, among others. The ASD/C3I will redirect FFRDC resources, as necessary, to enable the group to obtain contractual support for joint integration and interoperability efforts.

5. Effective Date. The JC2I2G will commence formal operations as described in this MOA when all parties sign it or on 1 January 1999, whichever comes later.

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Commander, CECOM

JOHN A. GAUSS
Rear Admiral, USN
Commander, SPAWAR

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Senior Civilian Official
Office of the Assistant Secretary of Defense,
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NOV 24 1998

October 1, 1999

APPENDIX C

Memorandum of Agreement

Joint Command and Control Integration and Interoperability Group and USACOM

30 Aug 1999

MEMORANDUM OF AGREEMENT
BETWEEN
THE UNITED STATES JOINT FORCES COMMAND (USJFCOM)
AND
THE JOINT C2 INTEGRATION/INTEROPERABILITY GROUP (JC2I2G)

SUBJECT: Roles, Relationships and Responsibilities between USJFCOM and the JC2I2G/Joint Forces Program Office (JFPO)

1. Purpose.

This Memorandum of Agreement (MOA) officially establishes the roles, relationships and responsibilities between the United States Joint Forces Command (USJFCOM) and the Joint C2 Integration/ Interoperability Group (JC2I2G) regarding direction of and support provided by the Joint Forces Program Office (JFPO).

2. References.

a. Section 912(c) of the Defense Authorization Act for FY 1998: Joint Study Group Final Report on the Establishment of a Joint Command, Control, and Communication (C3) Integrated System Development Process, August 1999.

b. Undersecretary of Defense (Acquisition and Technology) Memorandum dated 27 July 1999 subject: Decision Memorandum and Meeting Summary – Joint Command, Control Integration/Interoperability Group (JC2I2G) In Process Review (IPR) of July 8, 1999.

3. Background.

Section 912 of the FY 98 Defense Authorization Act included several requirements pertaining to acquisition. In an April 1998 report to Congress responding to some of those requirements, the Secretary of Defense noted that "joint operations have been hindered by the inability of forces to share critical information at the rate and at the locations demanded by modern warfare." To address this problem, the Secretary directed an examination of ways to establish a joint command, control, and communication (C3) integrated system development process.

In response to the Secretary's report to Congress, the Under Secretary of Defense (Acquisition and Technology) and the Senior Civilian Official of the Office of the Assistant Secretary of Defense (Command, Control, Communications, and Intelligence) (ASD(C3I)) established the Joint Command and Control Integration/Interoperability Group (JC2I2G), comprised of Commanders of the Services' Command and Control (C2) systems development organizations/acquisition centers: the Army's Communications Electronics Command (CECOM), the Air Force's Electronic Systems Center (ESC), and the Navy's Space and Naval Warfare Systems Command (SPAWAR), to focus their efforts on joint C2 system integration and interoperability. The overall mission of the JC2I2G is to promote and implement Joint C2 integration and interoperability among the Services by ensuring: future efforts will be "Joint First"; Joint C2 integration and interoperability will be advanced at every opportunity; and opportunities for integration/interoperability will be discovered and exploited through joint experimentation and innovation to advance the CINCs' C2 capability. To accomplish this mission, the JC2I2G agreed to collocate some of the personnel from their respective systems development/acquisition commands to establish three CINC Interoperability Program Offices (CIPO), one at each of their headquarters locations, and a distributed Joint Forces Program Office (JFPO). The primary mission of the JFPO is to achieve horizontal integration across CINCs and across C2 systems, through coordination and cooperation with the Joint Staff and CINCs, especially with USJFCOM because of its roles as Joint Force Provider, Integrator and DOD's executive agent for Joint Experimentation.

4. Scope. This MOA applies to both military and government civilian personnel assigned to the JC2I2G JFPO and USJFCOM, and to all contractor or other personnel working in a designated support role to these organizations.

5. Roles, relationships and responsibilities.

a. JFPO shall:

1. Act as CIPO coordinating authority to identify cross-CINC joint interoperability issues and synchronize cross-CINC solutions where feasible.

2. Support USJFCOM in assessing joint interoperability during MNS/ORD/CRD requirements and milestone reviews and the Joint Warrior C4 Systems Integrator (JWC4SI) Process.

3. Support USJFCOM in tracing future C4 systems requirements to other CINC needs and solutions.

b. USJFCOM shall:

1. Have USJFCOM J6 serve as a principal member of the JC2I2G.

2. Prioritize JFPO support efforts to focus on major cross-CINC joint interoperability issues and challenges that have been identified through operational assessments.

3. Screen and validate all JFPO support requests emanating from within USJFCOM.

4. Provide the JFPO with liaison/coordination interface to the Joint Staff.

6. Effective Date. This MOA will be effective 1 October 1999 and will be subject to review by all parties on or about 1 October 2000.

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